

IN THE CLAIMS

1. (Canceled)

2. (Previously Amended) An information relay device connected between a plurality of logical or physical networks for performing an operation for relay of information between said networks, comprising:

a transmit/receive processing unit for receiving a general purpose multicast message from one of said plurality of networks and transmitting a multicast message to at least one of said plurality of networks; and

a protocol conversion processing unit for converting, in the case where the general purpose multicast message received by said transmit/receive processing unit is a multicast protocol message of a certain level, said multicast protocol message of the certain level into a multicast protocol message of another level, wherein

in the case where the general purpose multicast message received by said transmit/receive processing unit is said multicast protocol message of the certain level, said protocol conversion processing unit rewrites a multicast address of said certain level in the received multicast message into a

multicast address of said other level and rewrites a message of said certain level indicating a transmit request or a transmit refusal request in the received multicast message into a message of said other level having a meaning equivalent to a meaning of the message of said certain level.

3. (Original) An information relay device according to claim 2, further comprising a multicast information memory for storing a relationship between said multicast address of said other level and a receiver corresponding thereto, wherein in the case where the multicast message received by said transmit/receive processing unit indicates a transmit request and the updating for entry addition, said protocol conversion processing unit adds the rewritten multicast address of said other level in the received multicast message and a corresponding receiver into said multicast information memory, and in the case where the multicast message received by said transmit/receive processing unit indicates a transmit refusal request and the updating for entry deletion, said protocol conversion processing means deletes the rewritten multicast address of said other level layer in the received multicast message and a corresponding receiver from said multicast information memory.

4. (Previously Amended) An information relay device according to claim 2, wherein in the case where the general purpose multicast message received by said transmit/receive processing unit is a multicast protocol message of the third layer in an OSI reference model, said protocol conversion processing unit converts said multicast protocol message of the third layer into a multicast protocol message of the second layer and said transmit/receive processing unit transmits said multicast protocol message of the second layer to at least one of said plurality of networks.

5. (Previously Amended) An information relay device connected between a plurality of logical or physical networks for performing an operation for relay of information between said networks, comprising:

a transmit/receive processing unit for receiving a general purpose multicast message from one of said plurality of networks and transmitting a multicast message to at least one of said plurality of networks; and

a protocol conversion processing unit for converting, in the case where the general purpose multicast message received by said transmit/receive processing unit is a multicast

protocol message of a certain level, said multicast protocol message of the certain level into a multicast protocol message of another level, wherein

a multicast address memory for storing a multicast address of said other level, wherein in the case where the general purpose multicast message received by said transmit/receive processing unit is said multicast protocol message of the certain level, said protocol conversion processing means rewrites a multicast address of said certain level in the received multicast message into a multicast address of said other level by use of the corresponding multicast address in said multicast address memory.

6. (Previously Amended) An information relay device connected between a plurality of logical or physical networks for performing an operation for relay of information between said networks, further comprising:

a transmit/receive processing unit for receiving a general purpose multicast message from one of said plurality of networks and transmitting a multicast message to at least one of said plurality of networks; and

a protocol conversion processing unit for converting, in the case where the general purpose multicast message received

by said transmit/receive processing unit is a multicast protocol message of a certain level, said multicast protocol message of the certain level into a multicast protocol message of another level, wherein

a multicast address memory for storing a prefix portion of a multicast address of said other level, wherein in the case where the general purpose multicast message received by said transmit/receive processing unit is said multicast protocol message of the certain level in an OSI reference model, said protocol conversion processing unit rewrites a multicast address of said certain level in the received multicast message into a multicast address of said other level in the OSI reference model by use of the prefix portion of the corresponding multicast address in said multicast address memory.

7. (Original) An information relay device according to claim 6, further comprising a monitor processing unit for monitoring a multicast message of said other level on said networks to store the monitored multicast message of said other level into said multicast address memory.

8. (Original) An information relay device according to claim 6, wherein in the case where the general purpose multicast message received by said transmit/receive processing unit is a multicast protocol message of the second layer in an OSI reference model, said protocol conversion processing unit converts said multicast protocol message of the second layer into a multicast protocol message of the third layer and said transmit/receive processing unit transmits said multicast protocol message of the third layer to at least one of said plurality of networks.

9. (Canceled)

10. (Previously Amended) An information relay device connected between a plurality of logical or physical networks for performing an operation for relay of information between said networks, comprising:

a transmit/receive processing unit for receiving a general purpose multicast message from one of said plurality of networks and transmitting a multicast message to at least one of said plurality of networks; and

a protocol conversion processing unit for converting, in the case where the general purpose multicast message received

by said transmit/receive processing unit is a multicast protocol message of a certain level, said multicast protocol message of the certain level into a multicast protocol message of another level, wherein

the general purpose multicast message received by said transmit/receive processing unit is a multicast protocol message of the second or third layer in an OSI reference model, a multicast protocol of said second layer is GMRP (GARP Multicast Registration Protocol), and a multicast protocol of said third layer is IGMP (Internet Group Management Protocol), DVMRP (Distance Vector Multicast Routing Protocol), PIM-SM (Protocol-Independent Multicast-Sparse Mode), PIM-DM (Protocol-Independent Multicast-Dense Mode), MOSPF (Multicast Extension to OSPF), CBT (Core-Based Trees) or MLD (Multicast Listener Discovery) of IPv6.

11-14. (Canceled)

15. (Currently Amended) An information relay device coupled to a plurality of logical or physical information networks for relaying a packet received from one of said plurality of information networks to another of said plurality of information networks, comprising:

a plurality of ports coupled to said plurality of information networks, respectively;

a first processing unit which receives a packet through one of said plurality of ports and transmits the received packet to one of said plurality of ports coupled to a destination one of said plurality of information networks;

a second processing unit which, when said first processing unit receives through one of said plurality of ports a multicast protocol message in a second layer of an ~~OSI~~ ~~(Open Systems Interconnect)~~ Open System Interconnect (OSI) reference model, ~~(hereinafter which is referred to as an L2 multicast protocol message,)~~ for requesting entering into or leaving from a multicast service, stores an L2 multicast address contained in said L2 multicast protocol message and said one of said plurality of ports receiving said L2 multicast protocol message so as to be associated to each other in a case where said received L2 multicast protocol message is a join message, and deletes said L2 multicast address contained in said L2 multicast protocol message among L2 multicast addresses stored in advance; and

a conversion unit for converting said L2 multicast protocol message into a multicast protocol message in a third

layer of the OSI reference model (hereinafter referred to an L3 multicast protocol message), wherein

when said first processing unit receives said L2 multicast protocol message, said conversion unit converts said L2 multicast address contained in said L2 multicast protocol message into an L3 multicast address, converts a first type information contained within said L2 multicast protocol message and representing that said L2 multicast protocol message is a join message or a leave message into a second type information representing that said L3 multicast protocol message is a join message or a leave message, and generates said L3 multicast protocol message containing said converted L3 multicast address and said converted second type information.

16. (Previously Amended) An information relay device according to claim 15, further comprising:

a monitoring processing unit for monitoring whether said first processing unit has received an L3 multicast packet, and when it is monitored that said first processing unit has received the L3 multicast packet, extracting and holding a prefix address portion of an L3 multicast address contained in said received L3 multicast packet, wherein

said conversion unit replaces a predetermined upper address portion of said L2 multicast address by said prefix portion held by said monitoring processing unit thereby to convert said L2 multicast address into said L3 multicast address.

17. (Previously Amended) An information relay device according to claim 15, wherein said first processing unit includes a relay unit which searches, when an L2 multicast packet is received, whether said second processing unit stores an L2 multicast address contained in said received L2 multicast packet, and, when said second processing unit stores the L2 multicast address contained in said received L2 multicast packet, relays said L2 multicast packet through one of said plurality of ports associated with said searched L2 multicast packet.

18. (Previously Amended) An information relay device according to claim 15, wherein a multicast protocol of said second layer is GMRP (GARP Multicast Registration Protocol), and a multicast protocol of said third layer is IGMP (Internet Group Management Protocol), DVMRP (Distance Vector Multicast Routing Protocol), PIM-SM (Protocol-Independent Multicast-

Sparse Mode), PIM-DM (Protocol-Independent Multicast-Dense Mode), MOSPF (Multicast Extensions to OSPF), CBT (Core-Based Trees) or MLD (Multicast Listener Discovery) of IPv6.

19. (Currently Amended) An information relay device coupled to a plurality of logical or physical information networks for relaying a packet received from one of said plurality of information networks to another of said plurality of information networks, comprising:

a plurality of ports coupled to said plurality of information networks, respectively;

a first processing unit which receives a packet through one of said plurality of ports and transmits the received packet to one of said plurality of ports coupled to a destination one of said plurality of information networks;

a conversion unit for converting, when said first processing unit receives through one of said plurality of ports a multicast protocol message in a third layer of an OSI (Open Systems Interconnect) reference model, ~~hereinafter~~ which is referred to as an L3 multicast protocol message, for requesting entering into or leaving from a multicast service, said L3 multicast protocol message into a multicast protocol message in a second layer of the OSI reference model,

~~(hereinafter~~ which is referred to as an L2 multicast protocol message); and

a second processing unit which stores an L2 multicast address contained in said L2 multicast protocol message and said one of said plurality of ports receiving said L2 multicast protocol message so as to be associated to each other in a case where said received L2 multicast protocol message is a join message, and deletes said L2 multicast protocol message is a join message, and deletes said L2 multicast address contained in said L2 multicast protocol message among L2 multicast addresses stored in advance, wherein

said conversion unit converts an L3 multicast address contained in said L3 multicast protocol message into an L2 multicast address, converts a first type information contained within said L3 multicast protocol message and representing that said L3 multicast protocol message is a join message or a leave message into a second type information representing that said L2 multicast protocol message is a join message or a leave message, and generates said L2 multicast protocol message containing said converted L2 multicast address and said converted second type information.

20. (Previously Amended) An information relay device according to claim 19, wherein said conversion unit replaces a first upper address portion of said L3 multicast address by a second upper address portion which address bit number differs from an address bit number of said first upper address portion thereby to convert said L3 multicast address into said L2 multicast address.

21. (Previously Amended) An information relay device according to claim 19, wherein said first processing unit includes a relay unit which searches, when an L2 multicast packet is received, whether said second processing unit stores an L2 multicast address contained in said received L2 multicast packet, and, when said second processing unit stores the L2 multicast address contained in said received L2 multicast packet, relays said L2 multicast packet through one of said plurality of ports associated with said searched L2 multicast address.

22. (Previously Amended) An information relay device according to claim 19, wherein a multicast protocol of said second layer is GMRP (GARP Multicast Registration Protocol), and a multicast protocol of said third layer is IGMP (Internet

Group Management Protocol), DVMRP (Distance Vector Multicast Routing Protocol), PIM-SM (Protocol-Independent Multicast-Sparse Mode), PIM-DM (Protocol-Independent Multicast-Dense Mode), MOSPF (Multicast Extensions to OSPF), CBT (Core-Based Trees) or MLD (Multicast Listener Discovery) of IPv6.